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**(54) MANUFACTURE OF SEMICONDUCTOR DEVICE**

(57) Abstract:

**PURPOSE:** To improve electric characteristics with strain in an element region eliminated, by heat-treating the reverse surface of a semiconductor substrate, with a semiconductor element on its top surface, at a temperature of more than 200°C after mechanically polishing the reverse surface to a fixed thickness.

**CONSTITUTION:** On semiconductor substrate 1, epitaxial layer is grown, the surface is covered with oxidized film 3, and after base region 4 and emitter region 5 are both provided, metal electrode 6 is fitted. The reverse surface of substrate 1 of the semiconductor device formed in this way is mechanically polished to a thickness suitable for pelletizing, thereby generating strain between substrate 1 and epitaxial layer 2. In other words, plastic strain layer 11 close to polished surface 7, plastic-elastic strain layer 12 from its top

closely to the surface of substrate 1, and elastic strain layer 13 from its top to the surface of epitaxial layer 2 are formed respectively. Next, a heat treatment of 400W500°C is done in N<sub>2</sub> gas for sixty minutes to remove strain completely except elastic strain layer 12 near polished surface 7. Consequently, the manufacture yield improves.

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